GIAC GPS Interagency Advisory Council

June 17, 1999

MEMORANDUM FOR: Colonel Richard Skinner, USAF
Office of Deputy Assistant Secretary of
Defense for C3ISR and Space Systems

Joseph F. Canny
Deputy Assistant Secretary for
Transportation Policy
Department of Transportation

FROM: Charles W. Challstrom
Chair, GPS Interagency Advisory Council

SUBJECT: Early Implementation of Civil Signals

This memorandum provides input to the Interagency GPS Executive Board (IGEB) Senior Steering Group for Third Civil GPS Signal Implementation based upon the discussions of the May 12, 1999, meeting of the GPS Interagency Advisory Council (GIAC). The GIAC discussions included the topics of the IGEB meeting of May 11, 1999. In particular, the early implementation of the new civil signals was of very great interest to GIAC.

The GIAC enthusiastically endorses the implementation of the L5 signal (1176.45 MHz) at the earliest possible opportunity. The greatest benefits to civil applications would come from the L5 deployment. The new hybrid signal structure under consideration for L5 is more robust, and has more accurate pseudorange resolution than the current C/A and P(Y) signals. L5 will have a major impact on geodesy and precision navigation; where we could get robust, single-epoch, carrier-phase positioning and ambiguity resolution over 40 km, to better than 10 cm accuracy through dual widelaning. And, we expect to increase that distance and accuracy through support models of ionosphere and troposphere.

At the Chief Executive Officer Roundtable, held at the Department of Commerce in December 1998, numerous economic benefits of GPS were described. Those participants wholeheartedly advocated early implementation of the GPS civil signals and expressed the needs for the highest possible positioning accuracy. GIAC recognizes that the greatest number of benefits described in the

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CEO report will be obtained through the deployment of the L5 signal, and that funds allocated to early implementation will have maximum leverage if spent on early L5 deployment.

The GIAC envisions that the L5 signal will be of major benefit, not only to aviation, but to agriculture, automotive, banking, communications, construction, lumber, shipping, space systems, surveying, and transportation sectors. The amount of economic benefit will be related to how widely and how quickly GPS technology can be deployed. The GIAC respectfully recommends that the cost analyses conducted by the GPS Joint Program Office include the scenarios of early L5 deployment. This would be of great support in providing the IGEB with the information it requires to give the leadership and vision for the realization of GPS as a true national resource.

GIAC recognizes that the addition of a C/A code on the L2 frequency (1227.6 Mhz) will add additional costs to the early deployment of civil signals. However, the agencies represented by GIAC will be able to collaborate with NASA in building a proposal for monitoring the civil signals under discussion. If this monitoring proposal can be implemented, there could be an estimated $20 million cost savings that may ease the decisions on early civil signal deployment.